Environment and Natural Resources Trust Fund

M.L. 2021 Draft Work Plan

General Information

ID Number: 2021-159

Staff Lead: Corrie Layfield

Date this document submitted to LCCMR: January 28, 2021

Project Title: Collaborative State And Tribal Wild Rice Monitoring Program

Project Budget: $644,000

Project Manager Information

Name: Josh Knopik

Organization: MN DNR - Ecological and Water Resources Division

Office Telephone: (218) 203-4364

Email: joshua.knopik@state.mn.us

Web Address: https://www.dnr.state.mn.us/ewr/index.html

Project Reporting

Date Work Plan Approved by LCCMR:

Reporting Schedule: December 1 / June 1 of each year.

Project Completion: June 30, 2024

Final Report Due Date: August 14, 2024

Legal Information

Legal Citation:

Appropriation Language:

Appropriation End Date: June 30, 2024

Narrative

Project Summary: Work with tribal partners in the conservation of wild rice waters, creating a collaborative monitoring program and developing remote sensing tools for statewide assessment of natural wild rice abundance.

Describe the opportunity or problem your proposal seeks to address. Include any relevant background information.

Minnesota supports the largest abundance of natural wild rice in the United States, yet less than three percent of Minnesota's wild rice lakes are monitored, and that data is fragmented and isolated. Both the Governor's and the Minnesota Tribal Wild Rice Task Forces identified the need for a statewide monitoring program in 2018. DNR has no dedicated funds for wild rice monitoring, and limited funds for wild rice management. Adopted as the state grain in 1977, wild rice has declined in statewide distribution.

Wild rice is important to the state of Minnesota. In lakes, wild rice reduces phosphorous, protects shorelines from erosion, and provides habitat for, fish, birds, muskrats, and dragonflies. In the fall, wild rice lakes are important feeding areas for waterfowl during migration. Wild rice is culturally and spiritually significant to Minnesota tribes, and both tribal and non-tribal citizens harvest the seed.

Monitoring of wild rice has been initiated in parts of the state. The 1854 Treaty Authority began a program in 1998 to document wild rice abundance in northeastern Minnesota. From their initial program, a wild rice monitoring field guide and handbook was developed with partners, providing a tool for a more consistent approach.

What is your proposed solution to the problem or opportunity discussed above? i.e. What are you seeking funding to do? You will be asked to expand on this in Activities and Milestones.

We propose to create a tribal-state wild rice monitoring program to develop a coordinated baseline of wild rice abundance in Minnesota. Data collected from the field will be used to improve a remote sensing tool for assessing statewide abundance of wild rice, analyze trends, and support investigations of challenges facing wild rice.

Current wild rice mapping efforts include the use of new technologies. Tribal entities are using drones for lake wide assessment, and Colorado State University developed a remote sensing application using Google Earth Engine (GEE) to identify wild rice stands across Minnesota. While the initial GEE process shows utility, refinement is necessary before the tool can be operational.

We are seeking funding to:

1. Build and develop a collaborative for comprehensive wild rice monitoring.
2. Use developed methods to collect field data on wild rice abundance and disease assessment on a selected set of wild rice lakes.
3. Improve and operationalize the existing Google Earth Engine tool to estimate annual coverage of wild rice statewide.

Support has been expressed by the following Tribes: Fond du Lac, Leech Lake, Grand Portage, Mille Lacs, White Earth, and Red Lake Nations, and inter-tribal organizations including the 1854 Treaty Authority, MCT and GLIFWC

What are the specific project outcomes as they relate to the public purpose of protection, conservation, preservation, and enhancement of the state's natural resources?

A state-tribal collaborative for monitoring wild rice will:

- Increase consistency among data sets on wild rice density, coverage, disease and phenology;
- Improve our understanding of wild rice abundance and coverage at the state level;
- Enhance our collective understanding of cultural perspectives and approaches to conservation of wild rice;
- Develop more robust tools for monitoring wild rice;

- Reveal long-term changes in wild rice that may result from a variety of factors such as climate change, land use change and lake shore development;
- Improve relationships between state and tribal resource staff engaged in wild rice management.

Project Location

What is the best scale for describing where your work will take place?

Statewide

What is the best scale to describe the area impacted by your work?

Statewide

When will the work impact occur?

During the Project

Activities and Milestones

Activity 1: Coordinate and collect field data on wild rice abundance and health across a sub-set of wild rice lakes

Activity Budget: $451,000

Activity Description:
Annually coordinate and assess a minimum of 15-20 wild rice lakes using agreed upon monitoring methods and guidance. Depending on collaboration process, this number could increase substantially (50-100). Assessments on each wild rice lake may include: mapping of floating and emergent aquatic plants, collection of water samples for water quality, sediment sampling, and water level data. Multiple sample sites (minimum of 40 per lake) will be used to collect detailed plot data, including wild rice stem density, water depth, presence of other aquatic plants, sediment characteristics, and presence of disease (such as brown fungal spot and rice worms).

Activity Milestones:

Description	Completion Date
Work flow developed and guidance documents created (database and field applications)	June 30, 2022
Long-term monitoring lakes selected and monitoring tiers developed per collaborative agreement	June 30, 2022
Wild rice lakes sampled and monitoring data entered into database (annually)	December 31, 2023
Annual Review and Presentation of Data to Collaborative	February 28, 2024

Activity 2: Build and develop a collaborative for comprehensive wild rice monitoring.

Activity Budget: $73,000

Activity Description:
Building trust and developing relationships are critical for creating a long-term wild rice monitoring Collaborative. The milestones described below are potential milestones, recognizing that the point of the Collaborative is to share, discuss and build a framework for the collaborative that we construct together. Discussions have begun online, showing interest in a collaboration, however each tribal entity will decide whether to participate and at what level, should the proposal be funded.
Support for early and regular communication, and building awareness of cultural values and differences have been part of our first conversations. It is our intent to continue communication during the entire LCCMR process. Suggested milestones for the Collaborative include monthly coordination and collaborative meetings in the first year. Coordination prior to monitoring season and an annual meeting to discuss and present monitoring results has been identified as a priority.

Activity Milestones:

Description	Completion Date
Meet monthly with tribal and state partners to develop collaborative guidance.	June 30, 2022
Hold annual Collaborators Wild Rice Symposium	February 28, 2023
Wild Rice Conservation Report	June 30, 2024

Activity 3: Improve and operationalize Google Earth Engine remote sensing tool to estimate statewide wild rice coverage.

Activity Budget: $120,000

Activity Description:
Operationalize and refine the Google Earth Engine (GEE) wild rice mapping application initially developed by Colorado State University. Use the field data from the annually monitored wild rice lakes, and satellite imagery, to improve accuracy of the GEE model. With each year of lake monitoring, improve and assess wild rice mapping methods. The final product will include a consistent data workflow, resulting in annual, statewide wild rice coverage maps.

One of the constraints with the current model is accuracy in stands of wild rice that are sparse and stands which consist of mixed vegetation. In the first year, additional data will be collected to determine at what point (stems per square meter) accuracy of the model declines. A benefit of refining the model is that the incorporated satellite imagery and radar data is available back to 2017. This can potentially provide an extended look at wild rice abundance through the years, prior to the project years.

Activity Milestones:

Description	Completion Date
Trial and test field assessment/ ground truthing methods to enhance density gradients	January 31, 2022
Refine GEE model using increased stand density data and methods (DNR Resource Assessment)	June 30, 2022
(DNR Resource Assessment) develops annual statewide map of wild rice coverage (2023, 2024)	January 31, 2024
Statewide wild rice coveragemaps using 2017-2021 satellite imagery/radar data	June 30, 2024

Project Partners and Collaborators

Name	Organization	Role	Receiving Funds
Michael Northbird	Minnesota Chippewa Tribe Environmental Program	Collaboration building. Serves as central communicator for environmental and natural resource work among the Tribes (Mille Lacs, Bois Forte, Grand Portage, Leech Lake, White Earth and Fond du Lac).	No
Katie Draper	Mille Lacs Band of Ojibwe Department of Natural Resources	Collaboration building and wild rice monitoring interest. Sub-award to be determined.	Yes
Shane Bowe	Red Lake Nation Department of Natural Resources	Collaboration building; Currently involved in collecting drone imagery for wild rice monitoring. Sub-award to be determined.	Yes
Peter David	Great Lakes Indian Fish and Wildlife Commission	Conducts monitoring around Mille Lacs area and works in the 1837 treaty ceded territories. Mille Lacs Band of Ojibwe and Fond du Lac are member tribes.	Yes
John Bekkerus	White Earth Nation Division of Natural Resources	Collaboration building. Explore options for monitoring wild rice. Sub-award to be determined.	Yes
Nancy Schuldt	Fond du Lac Band of Lake Superior Chippewa Resource Management Division	Collaboration building. Wild rice monitoring and restoration experience. Sub-award to be determined.	Yes
Crystal Ng and Cara Santelli	University of Minnesota Interdisciplinary Manoomin Collaboration	Inputs on collaboration; Coordination on field sampling, analysis, and data collection.	Yes
Margaret Watkins	Grand Portage Band of Lake Superior Chippewa Environmental and Biology Department	Interested in collaboration building around wild rice monitoring. Sub-award to be determined.	Yes
Kate Hagsten	Leech Lake Band of Ojibwe Division of Resource Management	Collaboration building. Currently assessing wild rice on lakes within the reservation, and began a project to look at rice worms. Looking for partners to extend rice worm work. Sub-award to be determined.	Yes
Darren Vogt	1854 Treaty Authority	Collaboration building. Governed by the Bois Forte and Grand Portage bands. Currently monitor wild rice and may be interested in working to develop additional efforts. Sub-award to be determined.	Yes
Kristen Blann	The Nature Conservency	Collaboration building, field data collection and analysis. Sub-award to be determined.	No

Jody Vogeler	Colorado State University - Natural Resources Ecology Lab	Technology transfer and training on Google Earth Engine model development.	Yes

Dissemination

Describe your plans for dissemination, presentation, documentation, or sharing of data, results, samples, physical collections, and other products and how they will follow ENRTF Acknowledgement Requirements and Guidelines.
The end product of this project will be an annual maps of wild rice stands across much of the state of Minnesota. The final database, geographic extent, and map product platform will be decided by the collaborative (to be developed under Activity 2). One potential option that has been discussed is the Minnesota Natural Resource Atlas - host by UMN's NRRI. ENTRF will be acknowledged through use of the trust fund logos and attribution language on all shared products per the ENTRF Acknowledgment Guidelines.

Long-Term Implementation and Funding

Describe how the results will be implemented and how any ongoing effort will be funded. If not already addressed as part of the project, how will findings, results, and products developed be implemented after project completion? If additional work is needed, how will this be funded?
This project will provide the initial foundational framework to build a collaborative effort to monitor wild rice statewide. Increased coordination, expanded monitoring, and consistent data will allow resource managers to better understand impacts to wild rice, plan for protection and identify trends in wild rice distribution. Ongoing efforts will be made to MN DNR management and other organizations to prioritize making this a permanently funded program.

Budget Summary

Category / Name	Subcategory or Type	Description	Purpose	Gen. Ineligible	% Benefits	# FTE	Classified Staff?	$ Amount
Personnel								
Annette Drewes		Tribal Collaborative Coordinator			30%	0.45	X	$42,120
Field technician		Field data collection			20%	3		$152,064
							Sub Total	**$194,184**
Contracts and Services								
DNR Resource Assessment	Internal services or fees (uncommon)	Improve the Google Earth Engine remote sensing application, listed in Activity Three, and produce statewide wild rice coverage maps.				0		$100,000
Colorado State University - Natural Resources Ecology Lab	Professional or Technical Service Contract	Technology transfer of Google Earth Engine remote sensing process and algorithm. Provide training to DNR Resource Assessment staff to operationalize process. This entity developed the initial process and is the sole contractor.				0		$20,000
TBD	Sub award	Sub Awards granted to collaborative partners. Funds will be used for data gathering efforts such as hiring field staff (interns or seasonal technicians).				0		$270,000
							Sub Total	**$390,000**
Equipment, Tools, and Supplies								
	Tools and Supplies	Water Sampling supplies and analysis	Water sampling supplies and analysis					$7,500
	Equipment	Field sampling equipment	Canoes and other tools for field sampling.					$6,000
							Sub Total	**$13,500**
Capital Expenditures								

							Sub Total	**-**
Acquisitions and Stewardship								
							Sub Total	**-**
Travel In Minnesota								
	Miles/ Meals/ Lodging	lodging and meals	lodging and meals during field sampling					$12,716
	Other	DNR Fleet services	truck lease and mileage (3 trucks for 3 months/yr)					$10,000
							Sub Total	**$22,716**
Travel Outside Minnesota								
							Sub Total	**-**
Printing and Publication								
							Sub Total	**-**
Other Expenses								
		Direct and Necessary	DNR's direct and necessary costs pay for activities that are directly related to and necessary for accomplishing appropriated projects. HR Support (~$5,731), Safety Support (~$1,064), Financial Support (~$2780), Communication Support (~$1,324), IT Support (~$11,552), and Planning Support (~$1,149).					$23,600
							Sub Total	**$23,600**
							Grand Total	**$644,000**

Classified Staff or Generally Ineligible Expenses

Category/Name	Subcategory or Type	Description	Justification Ineligible Expense or Classified Staff Request
Personnel - Annette Drewes		Tribal Collaborative Coordinator	**Classified :** A portion (0.10 FTE) of Annette's time for tribal coordination will be in- kind. We are seeking an additional 0.15 FTE to ensure there is enough allocated time for this activity. The portion of her existing duties will be back filled.

Non ENRTF Funds

Category	Specific Source	Use	Status	Amount
State				
In-Kind	Natural Resources Specialist - Aquatic Ecologist, Clean Water Funded	Project Manager (0.25 FTE): Writing contracts, participating in collaborative development, budgeting, and some field sampling.	Secured	$70,200
In-Kind	Natural Resource Specialist - Aquatic Biologist, Heritage Enhancement Funded	Field Coordinator: Hire, and train technicians, Coordinate sampling efforts with partners, field sampling	Secured	$70,200
In-Kind	State Program Administrator - Clean Water Specialist : Water Recreation Funded	Tribal Collaborative Coordinator - Bring together tribal and other organizations, through meetings and workshops, to develop a wild rice monitoring collaborative. some field sampling	Secured	$28,080
In-Kind	Professor - Hydrology/Hydrogeology, funded by University of Minnesota, Twin Cities, Dept. of Earth & Environmental Sciences	University collaborative fieldwork coordinator - Assist with training field crew on hydrological monitoring and water/sediment sampling, coordinate field visits, participate in collaboration meetings with tribal partners and MN-DNR	Secured	$5,368
			State Sub Total	**$173,848**
Non-State				
In-Kind	Freshwater ecologist, The Nature Conservancy in MN, ND, SD	Collaboration building, field data collection and analysis	Secured	$25,000
In-Kind	Environmental Program – Program Manager, Minnesota Chippewa Tribe (MCT)	MCT Coordinator – participation and oversight through meetings and/or workshops related to project and Tribal collaboration	Secured	$2,500
In-Kind	Program Director, Red Lake Nation Water Resources Program	Collaboration building and field protocol development	Secured	$10,000
In-Kind	Water Projects Coordinator, Fond du Lac Band of Chippewa	Collaboration building, field monitoring development	Potential	$10,000
In-Kind	Resource Management Director, 1854 Treaty Authority	Collaboration building and field monitoring development	Potential	$10,000
In-Kind	Natural Resources specialist for Mille Lacs Band of Ojibwe, and associated staff and resources	Collaboration building, monitoring resources and staff time.	Potential	$7,500
			Non State Sub Total	**$65,000**
			Funds Total	**$238,848**

Attachments

Required Attachments

Visual Component

File: 28056695-850.pdf

Alternate Text for Visual Component

Title: Collaborative State-Tribal Wild Rice Monitoring Program. Pictures of a wild rice plant; a person measuring wild rice stems in the field, from a canoe; a map of Minnesota and the current and past distribution of wild rice; an aerial photo of Upper Rice Lake with areas of wild rice shown in dark purple and areas in the lake of mixed vegetation with shown in light purple. A three bulleted list of project activities and the logos from the natural resource divisions of Red Lake, Fond du La...

Optional Attachments

Support Letter or Other

Title	File
UMN_Ng_LetterOfSupport	95434c20-d98.pdf
TNC letter of support for wild rice proposal	ddc4460f-52c.pdf
Leech Lake Band of Ojibwe Letter of Support	42f0f3ab-b90.pdf

Difference between Proposal and Work Plan

Describe changes from Proposal to Work Plan Stage

Cuts were made to field sampling (Activity 1), $130,000 was cut from tribal sub awards, and $85,000 was cut from DNR technician FTE

Additional Acknowledgements and Conditions:

The following are acknowledgements and conditions beyond those already included in the above workplan:

Do you understand and acknowledge the ENRTF repayment requirements if the use of capital equipment changes?

N/A

Do you agree travel expenses must follow the "Commissioner's Plan" promulgated by the Commissioner of Management of Budget or, for University of Minnesota projects, the University of Minnesota plan?

Yes, I agree to the Commissioner's Plan.

Does your project have potential for royalties, copyrights, patents, or sale of products and assets?

No

Do you understand and acknowledge IP and revenue-return and sharing requirements in 116P.10?

N/A

Do you wish to request reinvestment of any revenues into your project instead of returning revenue to the ENRTF?

N/A

Does your project include original, hypothesis-driven research?

No

Does the organization have a fiscal agent for this project?

No

Collaborative State – Tribal Wild Rice Monitoring Program

A Three Part Approach:

- Build a collaborative around wild rice monitoring
- Collect consistent field data on wild rice health and abundance
- Improve a remote sensing tool to estimate statewide wild rice coverage